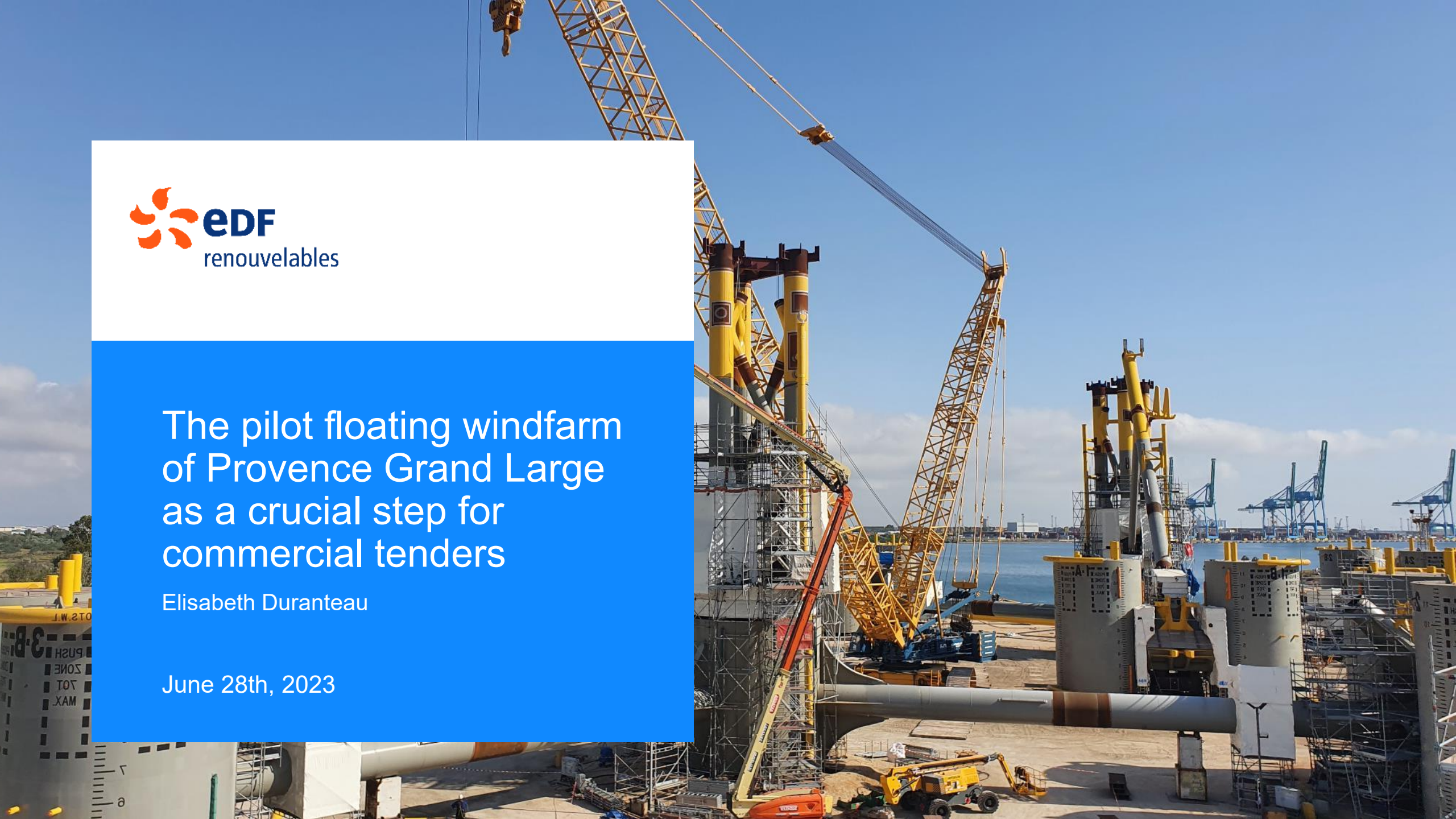




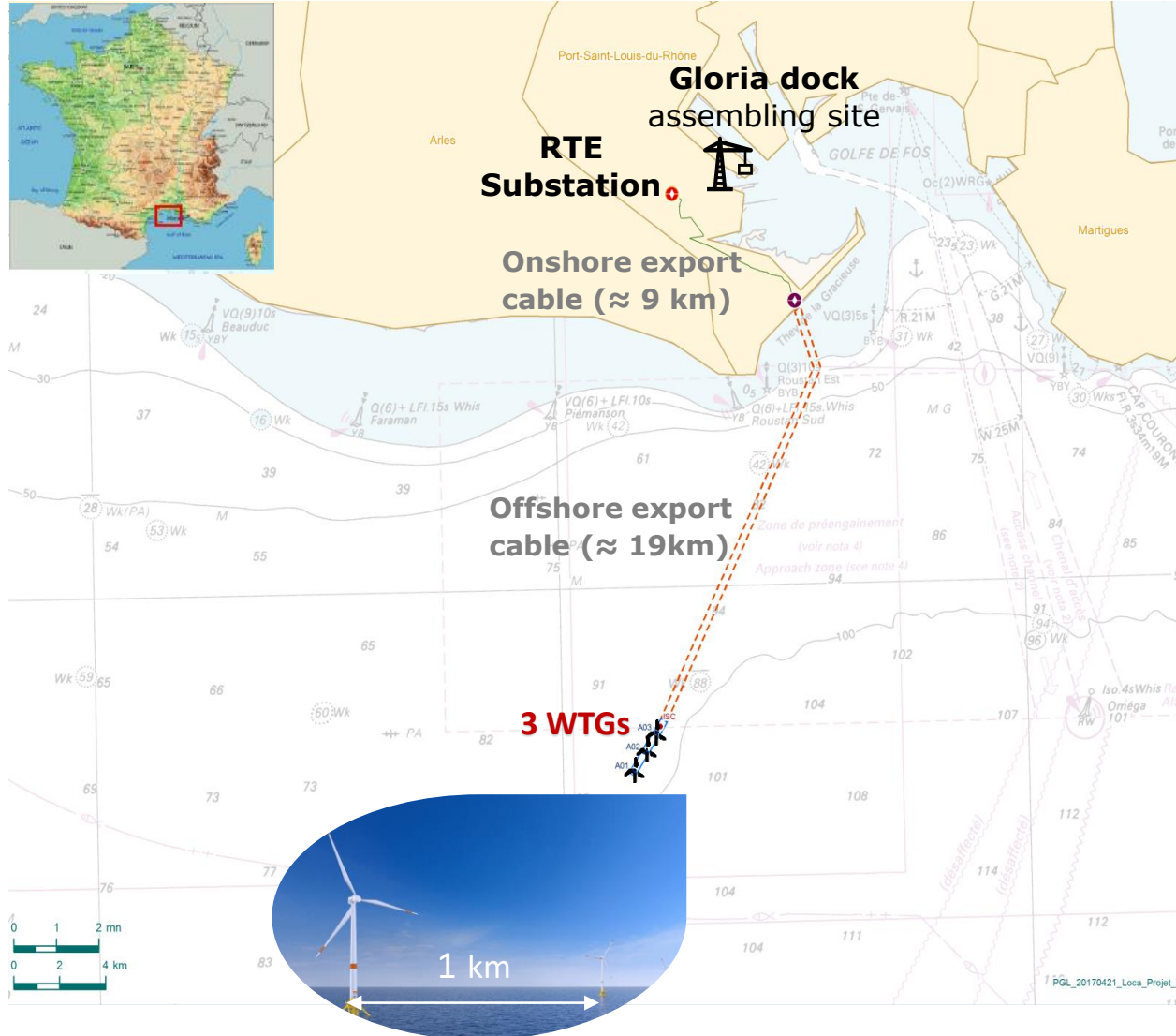
The pilot floating windfarm of Provence Grand Large as a crucial step for commercial tenders

Elisabeth Duranteau

June 28th, 2023



Provence Grand Large: a pilot project featuring 3 wind turbines

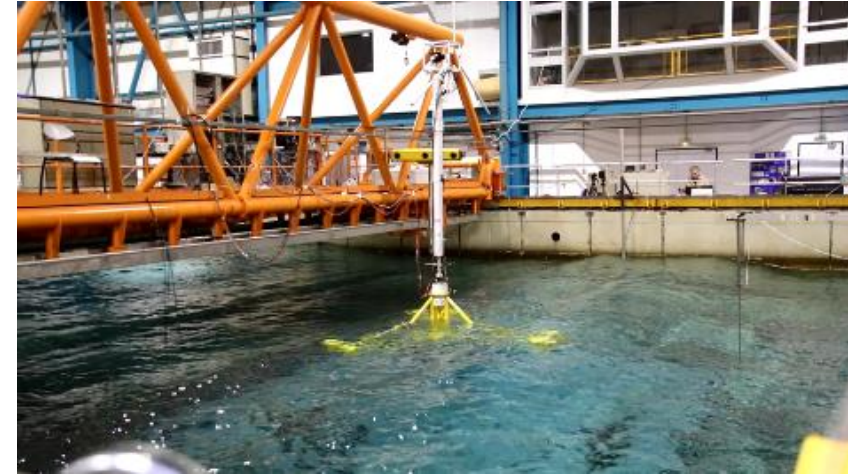


Pre-commercial floating farm, awarded by ADEME in 2017, under construction (COD 2024)

- 17 km from Port-Saint-Louis-du-Rhône
- Installed power : 25 MW
- Total depth : 100 m
- Average wind speed: 10 m/s
- Turbines: **Siemens-Gamesa** 8.4 MW direct-drive
- Floaters: Tension-Leg Platforms from **SBM Offshore**
- Grid: 66kV dynamic cables from **Prysmian Group** – direct link to shore

PGL is designed to demonstrate the technical and economic feasibility of the innovative technology

- ✓ **Demonstration of the [technical feasibility](#)**
 - Development, calibration and benchmark of a **numerical modelling** of floating wind turbines
 - Validation of numerical modelling by reduced scale **experimental tests in basin**
 - **Inter-array cables fatigue tests** to validate the global behaviour of the cables for the operational life
 - One of the first **[floating wind farm certified](#)** thanks to adaptations of fixed offshore wind and O&G standards to floating wind specificities (certification from Bureau Veritas)
- ✓ **First floating [project financed](#) by commercial banks, thanks to detailed due diligences of legal, technical and commercial aspects of the project**
- ✓ **PGL offers unique learning on [harbour and offshore operations](#)**
 - Harbour preparation is crucial for floating wind since turbines are integrated and pre-commissioned there
 - WTG integration at quayside requires extreme stability from the floater



© Océanide



Certification plays a key role but floating wind standards are still being consolidated

- ✓ Certification played a **central role** from design to manufacturing
- ✓ During the design phase, BV took part to the preliminary benchmark of codes and performed **many independent calculations** afterwards (loads, stability, structure etc.).
- ✓ **Some gaps** were identified and new floating specific standards are being consolidated, based on adaptation of fixed offshore wind and O&G standards to floating wind specificities



	WTG / Tower	FSS	IAC
Site Assessment	Conformity Statement delivered		
Basis of Design	Conformity Statement delivered		
Int. Load Analysis	Conformity Statement delivered		Included in the Design Evaluation
Design Evaluation	Conformity Statement delivered	Conformity Statement delivered	Conformity Statement delivered
Manufacturing surveillance	On-going. Close to completion		
Transport & Installation	On-going	On-going	Not included*
Commissioning	On-going	On-going	Not included

* no dynamic solicitation from the installation phase 4

A marshalling harbour requires robust preparation

- ✓ WTG integration at quay (vs. offshore) leads to **technical requirements specific to floating wind** as harbour must be ready for WTG integration and berthing of a few units
- ✓ In addition, **a marshalling harbour is a living quarter**, implanted in a pre-existing industrial hub, which requires robust organisation:
 - The marshalling harbour requires **facilities** with offices, canteen and access to all necessities.
 - Unlike fixed offshore wind, **many parties** are potentially involved in the operation (FSS, WTG, harbour), which creates **interfaces**.
 - All harbour activities generate **co-activities** to be carefully planned.



Harbor operations

- ✓ May 2023: FSS **load-out** [1], **float-off** [2]
- ✓ Summer 2023: **WTG** integration and pre-commissioning



2



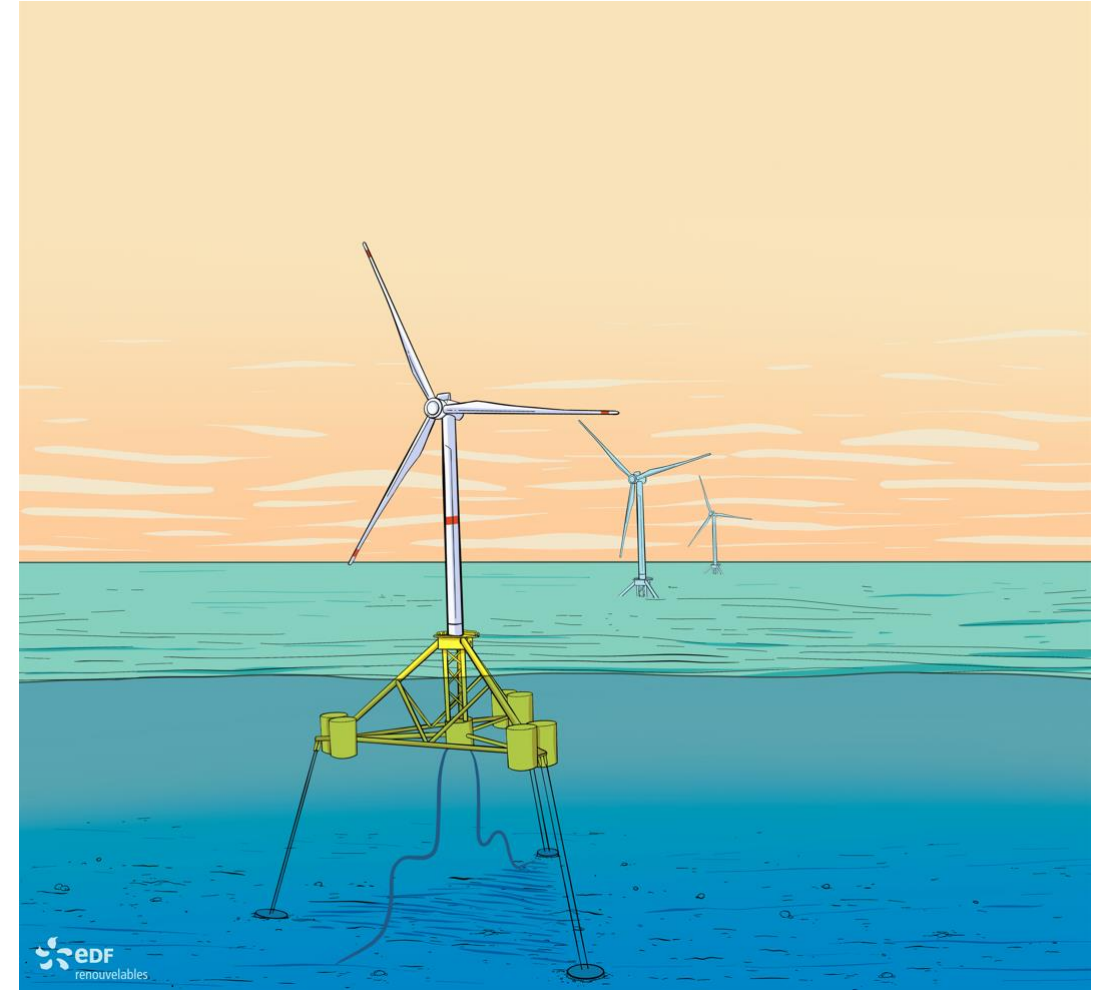
NB: Approximate schedule –
dependant on Weather Stand-By

Offshore operations will be launched this summer and the operational phase will begin early 2024

- ✓ **Summer 2023:** Start of **anchors installation** followed by offshore **towing** and **hook-up**
- ✓ **Autumn 2023:** **Cables installation** followed by **Grid testing**, including TSO tests
- ✓ **Early 2024:** final **offshore commissioning** and Run Tests



NB: Approximate schedule –
dependant on Weather Stand-By



PGL offers crucial learnings for the future commercial farms

- ✓ PGL relies on **technical innovations**, notably on methods and tools that create new references for floating wind and open the path to specific certification
- ✓ PGL offers unique learning for the full **supply chain**
- ✓ PGL offers key learning on **harbour operations** to prepare farms
- ✓ Clarification of the applicable **regulatory framework** (HSE, electric, legal) creates a precedent for future farms
- ✓ PGL opens the road for all **financing stakeholders** (banks, insurances etc.) and proved them feasibility and reliability of floating wind



Thank you

Project supported by:

